Impact of Knowledge Management Process on Knowledge-Worker Productivity in state Universities in Sri Lanka: Mediating Role of Employee Engagement

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Abstract

Knowledge management process (KMP) is one of the main sources of knowledge-worker productivity (KWP). However, the impact of KMP on KWP in higher education has received less attention in Sri Lanka and the previous studies in the same area found varying results regarding the impact of KMP on KWP. Hence, this study examines the impact of KMP (knowledge creation, knowledge sharing and knowledge utilization) on KWP (employees' timeliness, efficiency and autonomy) in Sri Lanka. It also investigates the mediating effect of employee engagements (intellectual, social and affective) on the relationship between KMP and KWP. Data collection was carried out using the survey method and 264 usable questionnaires were received from knowledge-workers of universities (Lecturers, Senior Lectures and Professors). Path analysis and boostrapping technique in AMOS were conducted to test the relationships among KMP, Employee Engagement and KWP. The results show that KMP, Employee Engagement and KWP are positively related. They also indicate that employee engagement partially mediates the relationship between KMP and KWP. The study's overall conclusion is that a firm's KWP is affected by its ability to improve employee engagement through KMP. To fully enhance their KWP, universities in Sri Lanka need better employee engagement in the intellectual, social and affective sense.

Keywords: Knowledge management process, Employee engagement, Knowledge worker productivity, universities.

1. Introduction

Knowledge assets considered as a way of creating value that can be sustainable over time and Knowledge Management (KM) is the key success factor in organizational performance (Peng, 2013). Higher education by nature regarded as knowledge-intensive institutions and the information and knowledge are fundamental to remain knowledge base. The application of KM critical success factors and effective practices that will rise the knowledge-worker performance (Saqib et al., 2017). In the context of KM application, the crucial factor entails the capability of any sector to take advantage of the knowledge that its employees have developed and also to manage it to improve performance. The knowledge-based view theory of the firm considers human capital factors and knowledge resource of knowledge-workers crucial for the sustainable innovation and productivity (Sergeeva and Andreeva, 2016). Kianto et al. (2016) stated that individual soft performance issues of human resource management is the most critical in organizational behaviors and that knowledge-workers' experience of KM process can improve their performance and productivity.

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Contemporary universities faced with many challenges while thriving to become centers of excellence and effective KM has been recognized as a promising tool for dealing with these challenges, although it is recognized as strategic tool lack of understanding of how knowledge is managed within universities was consistently addressed issue (Masadeh et al., 2017). However, universities carry significant roles in creation and dissemination of knowledge and driver for social changes and national development. According to Salavisa and Vali (2012) the role of the university has become even more important and expected to play an enhanced role in research and innovation aligned with knowledge constructed in the world of work.

Highly credible literature has revealed the prominence of KM process in organizations (Nonaka and Takeuchi, 1995) and managing knowledge in a conscious and systematic way to leverage intellectual capital to improve knowledge-worker productivity (KWP). Therefore, universities like other institutions with strategic intent, need to develop KM practices and manage in a systemic and institutional way. The strategic success depends on the functionality of KM process and knowledge will enhance university's effectiveness (Adhikari, 2010). Knowledge entails specific expertise, habit, skills and understanding derived from experience, training or learning processes, or expertise developed from effort and aptitude (Vine & Anita, 2015). Explicit knowledge is gained orally or from written texts, whilst tacit knowledge is attained via shared experience that is kept in the mind. As such, the sharing of knowledge will only improve if the company can please, retain, engage and enthrall its employees (Vine & Anita, 2015).

Companies that are transitioning from an industrial economy to an information/knowledge-based economy face the crucial challenge of boosting the productivity of knowledge-workers (Drucker, 1999). Unfortunately, this problem was not resolved by KM efforts which had instead focused more on the aspect of information management. KM and KW productivity are deemed as organizational assets towards achieving organizational objectives. The main objective of management is to drive the usage of its various resources as effectively and efficiently as possible towards creating competitive edge and increasing productivity. The effect of KM processes on KW productivity has been explored in past studies (Iranzadeh & Pakdelbonab, 2014). In order to fill the prevailing gaps, this current study investigates whether KM processes have any impact on KW productivity and subsequently how. Therefore, analysis of suitable KM strategies and practices for universities to improve the individual productivity through improved KM process capabilities and motivated employees' engagement in both individual and organizational levels is imperative to this context. Hence the research objectives formulated for this study as follows:

(i) to analyze the impact of knowledge management process on knowledge-worker productivity.

(ii) to examine the relationship between knowledge management, employee engagement, and knowledge workers productivity.

(iii) to examine the mediating effect of employee engagement between knowledge management process and knowledge-worker productivity.

This article is henceforth divided into these sections: Section 2 presents the review of KM and KWP literatures; Section 3 details the study methodology taking into account the sample, data collection and data analysis; Section 4 deliberates on the data analysis and findings, and Section 5 discusses and concludes the findings.

2. Literature Review

2.1 Knowledge-worker productivity

KM productivity increases individual, team and organizational efficiency; KM results improve as explicit/tacit knowledge capturing capability increases (Lee, 2003). Productivity refers to the correct and optimum utilization of existing manpower and material assets whilst efficiency is measured via performance; therefore, productivity is driven by efficiency and effectiveness.

"Knowledge Worker" is a term coined by Drucker (1959) who defined it as workers that utilize intangible resources. Today, the definition of the term is further refined to mean high-level employees who implement both theoretical and analytical knowledge. Generally, there is no specific definition for KW. Knowledge work is defined as knowledge creation and its usage by highly-skilled and self-directed employees so as to yield tangible and intangible results. Several other studies delineate KW as employees who are highly competent at gathering, synthesizing and applying knowledge (Turriago-Hoyos et al., 2016). Literatures on Knowledge-Worker Productivity (KWP) suggest that knowledge workers make up the key component of the 21st century workforce. Knowledge work entails the intellectual and cognitive processes involved in the creation and application of knowledge (Iazzolino et al., 2017; Palvalin, 2017).

The nature of work or tasks in the twentieth-century organizations was mechanical and manual. However, the predominant nature of work in the twenty-first century is Knowledge work that involves the use of knowledge as an input to get an intellectual knowledge-based output (Drucker, 1999). Therefore, the academics of universities as a knowledge workers use knowledge as input to get knowledge-based intellectual output to perform knowledge work. Therefore, it is crucial for the successful conduct of Universities' operations and performance. Drucker (1999) outlines six drivers of KWP: i) determination of the task/job of a knowledge-worker, ii) the knowledge-worker's job autonomy, iii) the knowledge-worker's ongoing innovativeness which is part of the job, iv) prevalence of ongoing learning and teaching, v) emphasis on output quality and quantity, and vi) knowledge-worker's treatment as an asset rather than a cost.

Despite not having one standard for determining KWP (Iazzolino et al., 2017), the reviewed literatures agree that the dimensions of KWP are the worker's timeliness, quality delivery, efficiency, autonomy, stakeholders' satisfaction, creativity and innovativeness (Iazzolino et al., 2017; Moussa et al., 2017; Palvalin, 2015).

2.2 Knowledge management process

Kianto et al. (2016) defined KM as the identification of the company's overall knowledge and its usage in creating competitive advantage. KM formulates, implements and evaluates strategies that guarantee the correct knowledge flow for the correct person at the correct time and in the correct place (Shujahat et al., 2017). There are two components to KM: critical success factors (KM practices and infrastructures) and the processes involved. This paper focuses on KM processes.

Generally, there are five main KM practices i.e. the acquisition, sharing, creation, codification and retention of knowledge (Abdi et al., 2018; Kianto et al., 2016). Knowledge acquisition entails the organization's gathering of external information (Kianto et al., 2016). Knowledge sharing is affected by five factors namely

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organizational context, interpersonal & team characteristics, cultural characteristics, individual characteristics and motivational drivers (Lee, 2001). Kianto et al. (2016) outlines knowledge creation as the encouragement to develop novel and valuable ideas and solutions. Knowledge codification refers to storage activities i.e. the conversion of knowledge into something explicit and its documentation for the organization. Finally, knowledge retention entails the strategies for enhancing KM. The creation and conversion of explicit knowledge into tacit knowledge and vice versa involve the four processes of the organizational knowledge creation theory i.e. socialization, externalization, combination and internalization or SECI (Nonaka & Takeuchi, 1995).

2.3 Employee engagement

Employee engagement is gaining momentum and popularity due to its identification as a key factor in determining employee and organizational performance. Employee engagement and KM processes have been identified as key strategic tools for achieving competitive advantage via the utilization of intellectual assets. Knowledge management is outlined as a driver of employee engagement (Sui Hai Juan et al., 2016).

Employee engagement entails the employees' emotional and intellectual link to their job, company, manager, or colleagues that prompt them to increase their cognitive, emotional and behavioral engagement at work that would lead to improved organizational results. It is also the degree to which the employees are driven to contribute to organizational success and to put voluntary effort towards achieving organizational objectives.

Organizational competitiveness relies more on intellectual capital. Hence, employee engagement must be improved in order to retain intellectual capital.

2.4 Knowledge management process and knowledge-worker productivity

Iranzadeh and Pakdelbonab (2014) investigated the relationship between KM processes and KW productivity in several sectors and found that all KM processes affect worker productivity. In the investment sector, Ali (2013) indicated that knowledge sharing practices positively affect work efficiency, capabilities, performance and customer satisfaction.

Theoretically, KM is proven as a driving factor for productivity in line with the theory proposed by Drucker. The SECI knowledge creation cycle introduced by Nonaka and Takeuchi (1995) creates valuable knowledge for employees that would enhance their job performance as well as the ongoing process improvement (Iranzadeh & Pakdelbonab, 2014).

Empirically many researchers have addressed the association between KM and KW productivity: Abualoush et al. (2018), Masadeh et al. (2017) and Mustapa and Mahmood (2016) pointed out the positive impact of KM process on KW productivity. Their findings indicate that KM generally improves employee productivity i.e. KM processes impact KW productivity positively. It is hence deduced here that KM processes affect KW productivity. The hypothesis below is thus proposed:

H1. KM processes have a positive and significant effect on KW productivity.

2.5 Knowledge management process and employee engagement

The way employees perform is influenced by how their organization disseminates information and knowledge. Employee training could leverage from KM, which improves employee flexibility and job satisfaction. Increased knowledge sharing and mutual learning have been proven to improve job satisfaction, which in turn results in higher employee engagement, lesser absenteeism, lower turnover intentions, better job performance and higher productivity levels. Employees display more physical, cognitive, and emotional engagement in their job. Hence, KM creates positive work environment that in turn influences employee engageme.

According to Sui Hai Juan et al. (2016), KM facilitates the degree of employee engagement. To add to the existing body of knowledge, this current study empirically examines the effect of KM processes on employee engagement in the context of Sri Lanka.

Employee engagement has been deemed as a key factor in KM processes. Empowered KWs actively seek knowledge and discover that information access positively affects KM processes as the gathered information and insights are applied on ensuing works. Motivated employees are also indicated to engage in further knowledge pursuit, creation and sharing because their own knowledge needs have grown. Hence, KM processes enable employee autonomy and make the employees feel useful and valuable.

Although very little research was found on how KM processes drive employee engagement, employee commitment was found to mediate the correlation between KM processes and organizational effectiveness. KM infrastructure components foster the employee commitment by nurturing the job satisfaction (Kianto et al., 2016). Similarly, KM practices support the work content components to foster the organizational commitment (Kianto et al., 2016). Thus, this study proposes the following hypothesis:

H2. KM processes have a positive and significant impact on employee engagement.

2.6 Employee engagement and knowledge-worker productivity

Employee knowledge of how organizational assets are being managed has a positive effect on employee engagement. A strong association between engagement and productivity has been indicated in literature. There are four major conditions that create high employee engagement which leads to higher productivity i.e. organizational culture, continuous reinforcement of people-based policies, significant metrics and organizational performance (Chandra, 2013). The University of Wisconsin conducted a research in association with Right management's in 2008/-2009 global benchmarking study revealed a significant relationship between employee engagement and productivity (Chandra, 2013).

Drucker's knowledge-worker's productivity theory supports that the more an organization treats its workers as the strategic assets, the more committed knowledge workers feel. This enhancement in their commitment leads to higher KW productivity (Drucker, 1999). In addition, the following empirical study by Khan et al. (2014) conclude the positive impact between these two constract. Higher the engagement or the bond a worker feels toward the organization, the more likely to get motivated to perform better (Porter et al., 1974; Mustapa and Mahmood, 2016). Thus, the worker engagement drive to do better on the tasks assigned and improve productivity. Hence, the study propose the following hypothesis:

H3. Employee engagement has a positive and significant effect on KW productivity.

2.7 Employee engagement mediates between knowledge management process and knowledge-worker productivity

The previous literature postulates the positive relationship between knowledge management process and knowledge-worker productivity; KM process and employee engagement; and employee engagement and KW productivity. Hence, it is assumed that there is a mediation effect between of Knowledge Management Process and Knowledge-worker Productivity (Preacher & Hayes, 2013), and the following hypothesis developed:

H4. Employee engagement significantly mediates the relationship between KM processes and KW productivity.

2.8 Research Model

Based on the literature the conceptual framework was developed with three variables. Knowledge management process (independent variable), knowledge-worker productivity (dependent variable) and employee engagement (mediating variable). Refer to the figure 1.

3. Methodology

3.1. Sample and data collection

This study uses the knowledge workers (Lecturers, Senior Lectures and Professors) in the State Universities of Sri Lanka as samples because knowledge-intensive sector academics possess more autonomy to concentrate on quality and productivity. Data collection was conducted using personal physical survey questionnaires. A total of 264 responses were received whereby 18% (47) are lectures while 74% (196) are Senior Lecturers and the remaining 8% (21) Professors. Gender wise, 32% are females and 68% are males. In terms of education, 58% hold PhDs and 42% have a Master's degree.

3.2. Instruments

There are three constructs in total for study and the measurement instruments are adapted for all constructs. The constructs are: Knowledge-Worker Productivity (KWP), Knowledge Management Processes (KMP), and Employee Engagement (EE). The construct of KWP is measured using the dimensions of timeliness, efficiency and autonomy. Measurement items are distributed as follows; meeting time demands (2 items), job autonomy at work (3 items), and work efficiency (2 items). The measurement scale was adapted from Morgeson and Humphrey (2006) and Tangen (2005). The construct composition is consistent with the studies of (Shujahat et al,. 2019; Moussa et al., 2017; Palvalin, 2017).

KMPs are measured using the CEN's adapted "European Guide to Good Practice in Knowledge Management: Guidelines for Measuring the Knowledge Management" (2004) scale. This scale consists of the three knowledge dimensions i.e. creation (3 items), sharing (3 items) and usage (3 items). This is in line with Lee and Choi (2003) and its usage in many other empirical researches as well as indications in various

literatures (Shujahat et al., 2017). Consultancy firms also use this scale as a viable diagnostic tool for assessing and solving knowledge processes issues in an organization.

The ISA Engagement Scale by Soane et al. (2012) is used to measure employee engagement following the concepts of Kahn (1990). The construct of employee engagement includes three dimensions and the items are adapted from ISA scale as follows; intellectual engagement (3 items), social engagement (3 items) and affective engagement (3 items).

4. Results and discussion

4.1. Measurement model

Evaluation for the measurement model involves the outer loadings, composite reliability, convergent validity and discriminant validity. The study satisfied all the required threshold values.

4.2 Reliability and Validity of Instrument

Data reliability was verified using Cronbach's alpha; a value closer to 1 means higher internal consistency reliability. This study recorded alpha coefficients of more than 0.9 thus indicating high reliability (Table 1). Meanwhile, a pilot study was conducted to verify the content validity using the independent and dependent variables' dimensions i.e. KMP, EE and KWP.

Based on the recommendation of Hair et al. (2012), convergent validity was assessed using factor loadings, composite reliability (CR) and average variance extracted (AVE). The threshold values for factor loadings are > 0.5, AVE > 0.5 and CR > 0.7. As shown in Table 1, all the threshold values for the measurement model have been exceeded, hence indicating adequate convergence validity. As such, all the construct items were retained in the model for advance analysis because their factor loadings were > 0.5.

Discriminant validity was determined by comparing the AVE's square root with the correlations. The diagonal values are higher than the values in the corresponding rows and columns suggesting that the measures are distinct. Hence, the findings on Table 2 show sufficient discriminant validity.

Table 1: CFA Results and Internal Reliability Test

Constructs	Measurement Items	Standard Loading	Cronbach α	CR	AVE
	PKC1	0.557			
	PKC2	0.754			
	PKC3	0.797			
Knowledge Management Process	PKS1	0.744			
	PKS2	0.732	0.950	0.941	0.644
	PKS3	0.922			
	PKU1	0.841			

	PKU2	0.975			
	PKU3	0.767			
	EEI1	0.835			
	EEI2	0.864			
	EEI3	0.969			
	EES1	0.880			
Employee Engagement	EES2	0.896	0.965	0.966	0.765
	EES3	0.934			
	EEA1	0.835			
	EEA2	0.879			
	EEA3	0.586			
Knowledge Worker Productivity	WPM1	0.876			
	WPM2	0.733			
	WPJ1	0.898			
	WPJ2	0.791	0.914	0.927	0.649
	WPJ3	0.536			
	WPW1	0.931			
	WPW2	0.798			

Table 2: Discriminant Validity

Constructs	KMP	EmpE	KWP
KMP.	**0.801**		
EmpE	0.781***	**0.872**	
KWP	0.704***	0.692***	**0.808**

Note: Diagonal values represent the square root of the AVE while the off-diagonal values represent the correlations.

4.3. Structural model

The correlation between the study variables were tested by first evaluating the structural model and then conducting an SEM analysis on the latent variables. The evaluation of the overall measurement model initiates the mediating effects analysis; the bootstrapping technique was utilized as the testing method. This study's structural equation modeling was carried out based on the covariance analysis. The structural model's path analysis results are presented in Figure 1. Table 3 presents the model fit index whilst Table 4 shows the structural model's results.
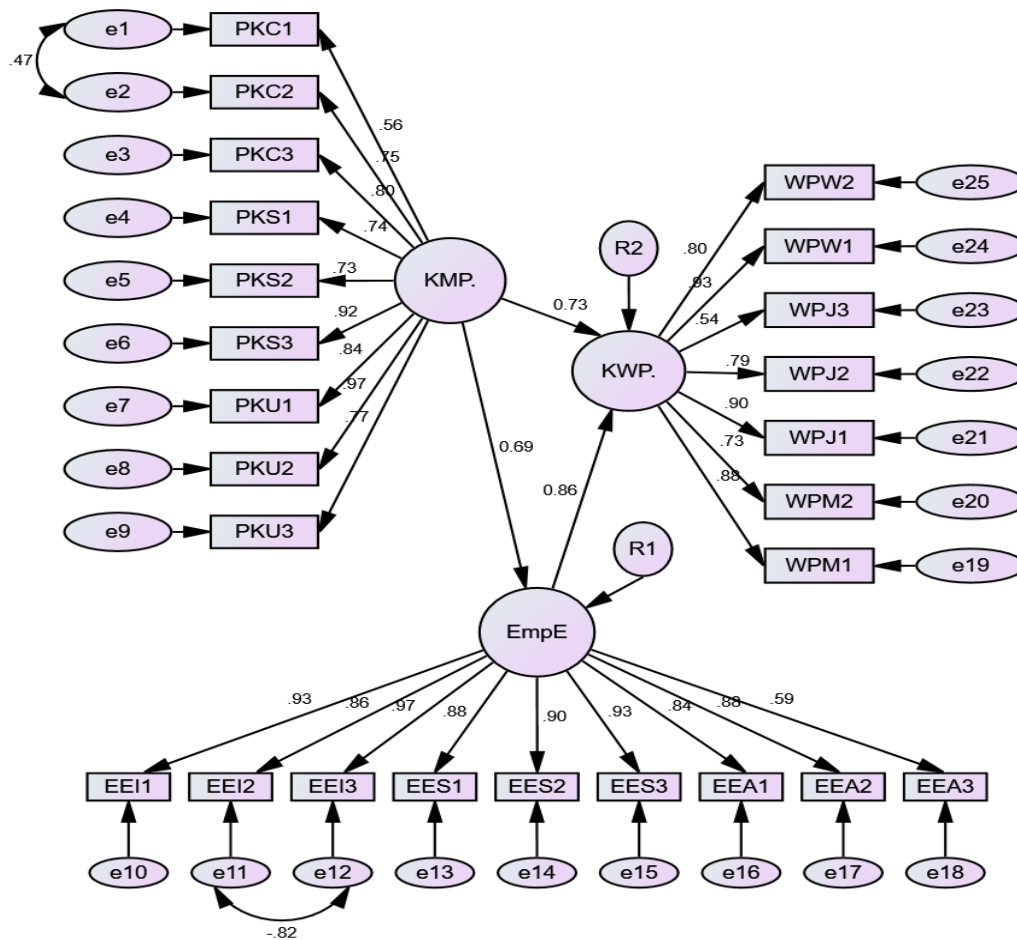
Figure 1: The results of the measurement model

4.3.1 Evaluation thee model fit indices

Table 3 presents the goodness-of-fit indexes chosen for this study and their threshold values for model evaluation based on the recommendations of previous researchers. The results indicate that the model is generally a good fit for fulfilling the set conditions. Since the confirmatory factor analysis demonstrated adequate model fit, the proposed model hence has a good fit with the observed data. The proposed CFA model has a good fit with the sample data hence making it fit for analysis.

4.3.2 Path Analysis

The predictive power of the structural model was evaluated by calculating the R squares (R^2) i.e. the amount of explainable variance by the exogenous variables. Both variables explained 76.9% of the variance in KW productivity. The path estimates and t-statistics for the proposed relationships were calculated using the bootstrapping method with a re-sampling of 1000. The analysis results show that all the direct relationship hypotheses are supported as presented in Table 4.

Table 3: Goodness of Fit Index and their Rule of Thumb

Index	Shorthand	Threshold	Author	Value Obtained	Conclusion
Chi-square / Degree of Freedom	χ2 / df	≤ 3	Kline (1998)	1.515	Good Fit
Root Mean Square Residual	RMR	<0.02		0.013	Good Fit
Goodness-of-fit Index	GFI	>0.90	Joreskog & Sorbom (1981)	0.928	Good Fit
Tucker Lewis Index	TLI	>0.90	Hu and Bentler (1999)	0.936	Good Fit
Comparative Fit Index	CFI	>0.90	Hu and Bentler (1999)	0.938	Good Fit
Root Mean Square Error of Approximation	RMSEA	≤ .05; good	Wan, (2002)	0.037	Good Fit

Table 4: Hypotheses Testing – Direct Relationship

Hypotheses	Beta	SE	t-value	P – Value	Results
Knowledge management process impact on knowledge-worker productivity positively and significantly	0.73	0.058	2.685	0.020	Accepted
Knowledge management process impact on employee engagement positively and significantly	0.69	0.061	1.296	***	Accepted
Employee engagement impact on knowledge-worker productivity positively and significantly	0.86	0.083	1.154	0.031	Accepted

4.3.3 Mediation Analysis

The bootstrapping method in AMOS was used to test the hypothesized mediating effect of Employee Engagement in the relationship between KMP and KWP. Table 5 presents the results. This table shows the test result using bootstrapping in which employee engagement has a significant mediating (partial) effect for KMP on knowledge worker performance; thus, hypothesis 4 of this study was supported.

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Table 5: Mediating effect of Employee Engagement between KMP and KWP

Hypothesis	Direct effect	Indirect Effect	Results
Employee engagement is a significant mediator between knowledge management process and knowledge-worker productivity	2.726***	1.974*	Partial Mediation

Note: ***=P<0.001; *=P<0.05

5. Discussion

This study proposed that knowledge management practices could be the driver of employee engagement and knowledge-worker productivity with special reference to the universities in Sri Lanka. Therefore, the mediation of employee engagement between knowledge management practices and knowledge-worker productivity was postulated. The results confirmed the partial mediation of employee engagement, thereby indicating that knowledge management practices could be the driver of higher employee engagement and knowledge-worker productivity. Below are the further discussions of the results.

The results on H_1 indicate that knowledge management practices and knowledge-worker productivity relationship is positive and significant. These findings are in congruence with the results of Mustapa and Mahmood (2016). The results are understandable because managing knowledge workers' task and contextual performance require the use of knowledge resources and experience of knowledge management practices as the input. KM practices provide the opportunities for knowledge use as input to increase the task improvisation of knowledge workers and contextual performance.

The findings on H_2 also point out that KM practices are the significant sources of fostering employee engagement. These results are in line with the findings of Sui et al. (2016) that KM could facilitate the level of engagement of employee. These findings are comprehensible as KM implementation involves nurturing the overall satisfaction on the job via impacting the work environment components and work content components (Kianto, 2016). This increase in satisfaction then leads toward an increase in the employee engagement.

The results of H_3 conclude that employee engagement fosters knowledge-worker productivity positively and significantly. These findings are in consistent with the results of number of empirical studies, systematic literature reviews and meta-analyses (e.g. Sui et al., 2016) that found the positive association between employee engagement and knowledge worker productivity. These results are in line with Drucker (1999) according to his theory of knowledge-worker's productivity, treating knowledge workers as an asset of the organization increases the overall organizational commitment of employees, which in turn leads the workers to put extra-efforts in addition to their normal duties, thereby improving their performance.

Finally, the results of H_4 point that organizational commitment is a partial mediator between KM process and knowledge – worker productivity association. The possible reason to explain the case of partial mediation might be because of the fact that the output of KM practices is knowledge, which is, and could be, used by knowledge workers as input to increase their knowledge-worker productivity. Hence, employee

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engagement could be the byproduct of KM practices while KW productivity could be the direct product. Moreover, the Sri Lankan universities' KMP was found to improve KW productivity thus fulfilling the explicit objective based on the provisions of the evidence-based knowledge, solidifying the theory of partial mediation.

6. Conclusion

KM processes entail knowledge creation, sharing and utilization, and has been used to improve employee engagement and knowledge-worker productivity. The results confirmed all four hypotheses, thus solidly supporting the correlation between the KM processes, employee engagement and KW productivity. The results revealed that the successful application of KM processes will help the firm improve employee engagement and KW productivity. The new findings are promising such as the importance of employee engagement in contributing to KW productivity in Sri Lankan universities. Additionally, employee engagement has a partial mediating effect on the correlation between KM processes and KW productivity. This study reached the conclusion that a firm's KW productivity is affected by its capability in improving employee engagement via the KM processes. To fully enhance their knowledge-worker productivity, universities in Sri Lanka need to enhance employee engagement (intellectual, social and affective). Because the organizational structure of universities in Sri Lanka, can help employees to get information from multiple sources. The application of the integrated employee engagement concept can facilitate universities in overcoming the challenges in their way.

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